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BRIEF REPORT

Cluster headache with Brugada electrocardiogram pattern: a case report

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Abstract Agents including the effect on sodium channel are restricted in patients with Brugada electrocardiogram (ECG) pattern or Brugada syndrome. On the other hand, many therapeutic agents for cluster headache (CH) block sodium channel. After recommended therapies without sodium channel blocking effect were failed in a 40-year-old male with CH whose ECG shows Brugada ECG pattern, clonazepam and codein phosphate, which are exceptional treatments for CH, were effective for severe unilateral orbital pain.

Keywords Brugada electrocardiogram pattern · Clonazepam · Cluster headache · Codein

Introduction

Cluster headache (CH) is one of the syndromes of trigeminal autonomic cephalalgias, which is characterized by severe unilateral pain localized to orbital, temporal, and midface areas accompanied by typical autonomic symptoms [1]. On the other hand, Brugada syndrome is known for a cause of sudden death due to ventricular fibrillation,

and is characterized by ST-segment elevation in the precordial electrocardiogram (ECG) leads (V1–3) associated with right bundle branch block [2, 3]. The same ECG pattern in patients without clinical symptoms (e.g., syncope, cardiac arrest, family history, etc.) is diagnosed as Brugada ECG pattern [4, 5]. Prevalence of CH is estimated to be 0.1–0.4% [1] and that of Brugada ECG pattern is 0.1% [5]. Therefore, a case of CH with Brugada ECG pattern is likely very rare.

Agents including the effect of sodium channel block are restricted in patients with Brugada ECG pattern or Brugada syndrome, as these have the potential to induce sudden cardiac arrest. Many treatments for CH, however, include sodium channel blocking effect, such as local anesthetics, lithium, and verapamil [1, 6]. Therefore, it would be difficult to treat severe headache in a case for CH patient accompanied with either Brugada syndrome or Brugada ECG pattern, especially if therapies without the effect on sodium channel were failed.

Case report

A 40-year-old Japanese male, who was diagnosed with Brugada ECG pattern (Fig. 1), was complained of CH. He had no history of ventricular tachycardia/fibrillation and familial sudden cardiac death.

The characteristics of pain was a severe right orbital pain occurring spontaneously at least one time in a day, lasting for 3 months in a year. This headache associated with tearing eyes and rhinorrhea. Alcohol intake aggravated the attacks of pain. Sumatriptan or oxygen inhalation had been used for symptomatic treatment, and prednisolone and valproic acid had been used as preventive treatment for over 10 years in Fukui Prefectural Hospital. Severity of

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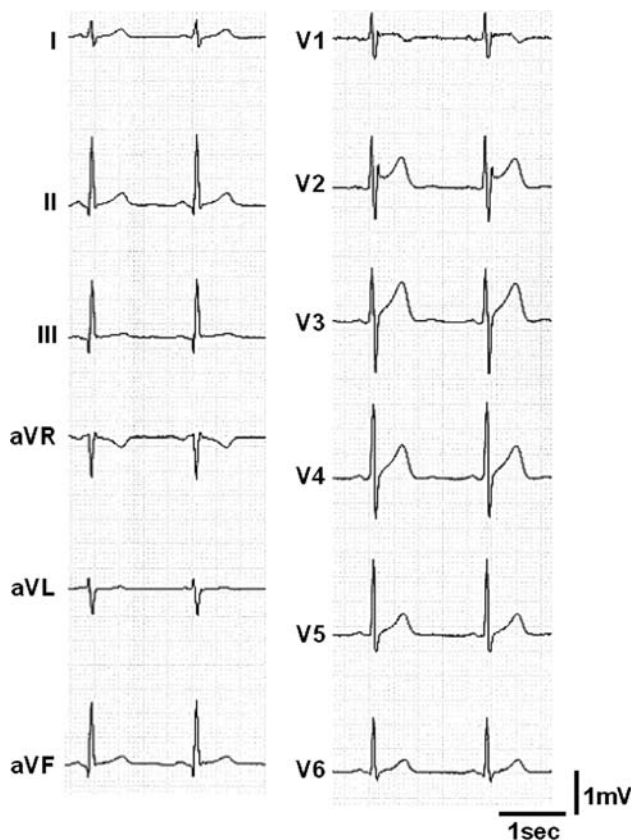


Fig. 1 Saddle-back type ST-segment elevation in lead V2

headache, however, has been aggravated gradually in spite of these treatments, and he was inquired for further treatment in Pain Clinic in University of Fukui, Faculty of Medical Sciences.

Although we prescribed zolmitriptan (2.5 mg p.o.) for attack and lomerizine (10–20 mg/day p.o.) for prevention at first, severity of headache and the number of attacks showed no change after prescription for 2 weeks. Local anesthetics for nasal instillation and nerve blocks, and also verapamil were not selected, because these agents block sodium channel and can induce lethal arrhythmias in a patient with Brugada syndrome or Brugada ECG pattern [7–11]. Then, we selected clonazepam and codein phosphate, which are exceptional treatments for CH [6, 12–14]. Clonazepam (2 mg/day p.o.) and codein phosphate (120 mg/day p.o.) suppressed severity of headache dramatically without ECG change. Frequency of attacks, however, showed no change.

Discussion

The ECG patterns in Brugada syndrome are divided into two types in association with a shape of ST-segment ele-

vation; coved- and saddle-back type. Sodium channel gene mutations are associated with Brugada syndrome, and therapeutic use of agents including sodium channel blocking effect is prohibited as it can induce ventricular fibrillation [2, 3]. Individuals with Brugada ECG pattern also have a risk of sudden death [4]. Local anesthetics block sodium channel. Epidural anesthesia with bupivacaine unmasked a subclinical form of Brugada ECG pattern or Brugada syndrome [7, 8]. Thoracic paravertebral block with ropivacaine induced ventricular tachycardia in a patient with Brugada syndrome [9]. Verapamil, a calcium blocker, also blocks sodium channel. Verapamil, used in patient with Brugada syndrome, caused ventricular fibrillation [10, 11].

Treatments for CH is divided into acute therapy aimed at aborting individual attacks and prophylactic therapy aimed at preventing recurrent attacks [1, 6]. Acute therapy includes inhalation of 100% oxygen, nasal instillation of lidocaine, subcutaneous sumatriptan, and ergot derivatives. As preventive therapy, there are verapamil, lithium, corticosteroids, and nonsurgical and surgical procedures (e.g., greater occipital nerve block, neurostimulation of the occipital nerve) [1, 6]. Among these recommended therapeutics, nasal instillation of lidocaine, nerve block with local anesthetics, and verapamil cannot be used in patients of CH accompanying with Brugada syndrome.

Clinical management with regard to the treatment for sudden cardiac death of asymptomatic patients with Brugada ECG pattern has yet to be determined [5]. Not all patients with Brugada ECG pattern are affected by Brugada syndrome. Mediastinal tumor is reported to cause Brugada ECG pattern [15]. Therefore, if careful examination eliminated a risk of sudden cardiac death in patients with both CH and Brugada ECG pattern, therapeutic agents for CH including sodium channel blocking effect could be used in these patients.

We treated a patient suffering from CH associated with Brugada ECG pattern, after the recommended therapeutics without the effect of sodium channel block were failed. As a risk of sudden cardiac death was not completely eliminated in this patient, we decided not to use agents including sodium channel blocking effect. Prescription of clonazepam and codein phosphate decreased the intensity of headache, although frequency of the attack showed no change. Both opioids and anti-convulsants without sodium channel blocking effects, such as clonazepam, gabapentin, and baclofen might be a therapeutic choice for CH accompanied with Brugada syndrome or Brugada electrocardiogram pattern. Surgical procedures, such as neurostimulation of the occipital nerve, might also be substituted for the treatment in this patient.

Conflict of interest None.

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